

## CLAIMS

1. A method of measuring in real time a radiological radiation dose absorbed by a region under inspection subjected to a flux of radiological radiation, the method comprising the steps consisting in:

a) detecting the incident radiation at at least one point of the region under inspection using at least a first bundle of measurement optical fibers (2) containing at least one fiber placed in said region under inspection and adapted to generate a light signal on receiving radiological radiation;

b) measuring said light signal away from the region under inspection after it has been transmitted along the measurement optical fiber; and

c) determining the dose of radiological radiation received by said measurement optical fiber on the basis of said light signal.

2. A method according to claim 1, in which during step c), a position where the radiological radiation is detected along said measurement optical fiber (2) is determined, and the dose of radiological radiation received at said position is calculated as a function of at least one parameter  $F^0_k$  specific to said optical fiber.

3. A method according to claim 2, in which at least one parameter  $F^0_k$  is obtained by a preliminary calibration step during which a dose of radiation is detected at at least one point of the region under inspection by means of a radiation detector that is not X-ray transparent.

4. A method according to claim 2 or claim 3, in which step b) is performed using a detector device comprising at least one cell, and in which the parameter  $F^0_k$  takes account of at least the optical fiber and at least one cell of the detector device associated with said fiber.

5. A method according to any preceding claim, in which the first measurement optical fiber bundle extends in a first direction, and in which step a) is also performed using a second optical fiber bundle containing at least one second measurement optical fiber (3) adapted to generate a light signal on receiving radiological radiation, and extending along a second direction forming an angle with the first direction.

6. A method according to claim 5, in which steps b) and c) are performed, for at least one overlap point (i, j) between a first measurement optical fiber i of the first bundle (2) and a second measurement optical fiber j of the second bundle (3), on the basis of the radiation detected at least by the first optical fiber i of the fibers of the first bundle (2), of the radiation detected by the second optical fiber j (3), and of the position of said overlap point (i, j) along the second optical fiber j.

7. A method according to claim 5 or claim 6, in which the steps b) and c) are performed, at least for an overlap point (i, j) between a first measurement optical fiber i of the first bundle (2) and a second measurement optical fiber j of the second bundle (3), on the basis of the radiation detected at least by the second optical fiber j (3) of the fibers in the second bundle, of the radiation detected by the first optical fiber i (2), and of the position of said overlap point (i, j) along the first optical fiber i.

8. A method according to any preceding claim, further comprising a step d) consisting in emitting an alarm signal if the accumulated received radiation dose exceeds a pre-established threshold.

9. A method according to any preceding claim, further comprising a step e) consisting in displaying on a screen (20) the dose of radiation received at at least one point of the region under inspection.

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10. A method according to claim 9, further comprising a step f) consisting in detecting the radiation transmitted through the region under inspection, and in displaying on a screen (20) the radiographic image as detected in this way.

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11. A method according to claim 10, in which the radiographic image obtained in step f) and the image of the received radiation dose as obtained in step e), are displayed on the same screen (20).

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12. A method according to any preceding claim, in which at least steps a), b), and c) are repeated for a plurality of points of the region under inspection, enabling a map to be obtained of the dose received by the region under inspection.

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13. A method according to any preceding claim, in which at least steps a), b), and c) are repeated for a plurality of measurement time intervals enabling time variation in the dose received at at least one point of the region under inspection to be obtained.

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14. A method according to claim 13, in which the radiation is generated by a pulsed source (18), and the repetition of at least steps b) and c) is synchronized with said source.

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15. A method according to any preceding claim, in which at least steps a), b) and c) are performed for at least two angles of incidence of the radiation, and in which combined use is made of the received radiation doses as

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determined in step c) for each of the angles of incidence.

16. A device for real-time measurement of a dose of radiological radiation absorbed by a region under inspection subjected to a flux of radiological radiation, the device comprising:

- a dosimeter comprising at least a first bundle of measurement optical fibers (2) containing at least one fiber placed in said region under inspection and adapted to generate a light signal on receiving radiological radiation in order to detect the incident radiation at at least one point of the region under inspection;

- measurement means for measuring said light signal away from the region under inspection after the light signal has been transmitted along the measurement optical fiber; and

- means for determining the dose of radiological radiation received by said measurement optical fiber on the basis of said light signal.

17. A device according to claim 16, in which the light signal is transmitted to a detector device (9) used for measuring it, transmission taking place along the measurement optical fiber (2) used for detecting the radiation, said fiber (2) having a first end (5), and along at least one clear optical fiber (6) extending from a first end (14) of the clear fiber that is connected to the first end (5) of the measurement optical fiber (2) to a second end (15) of the clear fiber, which second end is placed facing the detector device (9), and in which the means for determining the dose of radiation received at said point of said measurement optical fiber comprise a control unit (22) containing parameters that are specific to the optical fibers used.

18. A device according to claim 16 or claim 17, in which the first fiber bundle is disposed along a first direction and in which the dosimeter further comprises a second bundle of optical fibers comprising at least one second measurement optical fiber (3) disposed in a second direction forming an angle with the first direction.

19. A device according to any one of claims 16 to 18, in which each measurement optical fiber (2, 3) is comprised between two optically-insulating sheets (13).

20. A device according to any one of claims 16 to 18, in which each measurement optical fiber (2, 3) is molded in a reflective resin comprised between two optically-insulating sheets (13).

21. A device according to any one of claims 16 to 20, in which at least one bundle of optical fibers is integrated in an examination table.

22. A radiological installation comprising:

- a dosimeter comprising at least one bundle having at least one measurement optical fiber (2, 3) placed in a region under inspection, and adapted to generate a light signal on receiving radiological radiation, so as to enable the incident radiation to be detected at at least one point of said region under inspection;

- measurement means for measuring said light signal away from the region under inspection after it has been transmitted along the measurement optical fiber; and

- means for determining the dose of radiological radiation received by said measurement optical fiber on the basis of said light signal, and further comprising:

- a radiation generator (18);
- a radiographic detector (19); and
- means (20) for displaying the radiation dose received, said means also enabling radiographic images to

be displayed of the region under inspection as supplied by the radiographic detector (19).

23. An installation according to claim 22, further  
5 comprising an examination table (23).

24. An installation according to claim 23, in which said  
at least one bundle of measurement optical fibers is  
integrated in the examination table (23).

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25. An installation according to claim 24, further  
comprising at least one additional device that is not  
integrated in the examination table (23), for real-time  
measurement of a dose of radiological radiation absorbed  
15 by a region under inspection subjected to a flux of  
radiological radiation, the additional device comprising:

· at least an additional first bundle comprising at  
least one additional first measurement optical fiber (2,  
3) placed in said region under inspection and adapted to  
20 generate an additional light signal on receiving  
radiological radiation, in order to detect the incident  
radiation at at least one point in said region under  
inspection;

· additional measurement means for measuring said  
25 additional light signal away from the region under  
inspection after it has been transmitted along the  
additional measurement optical fiber; and

· additional means for determining the dose of  
radiological radiation received by said additional  
30 measurement optical fiber on the basis of said additional  
light signal.